A SUMMARY OF THE INVENTORY SURVEY OF NIGERIA INLAND WATERS AND PRELIMINARY ESTIMATES OF THEIR FISH YIELD POTENTIALS

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ABSTRACT

A summary of the inventory survey of Nigeria inland waters is presented. The survey reveals that Kano State tops the list in reservoir development with an existing water surface area of about 42,773 ha, while Anambra State has the least with about 38 hectares. No reservoir was recorded for Lagos and Rivers States. However, in aspects of existing fish ponds, a total of about 471 ha was recorded for Plateau State and about 5 ha for Niger State.

Preliminary estimates of Nigeria's fish yield potentials based on established production records of comparable water bodies in the tropics, at different levels of management, show that the available water mass in the country, estimated at about 12.5 million hectares, could yield a minimum of about 334,214 metric tonnes (m.t.) of fish per annum with little or no management and a maximum of about 511,703 metric tonnes per annum with adequate managment.

Comparison of the potential yields from inland sources with the projected fish production in Nigeria (1981 – 1985) based on supply and demand statistics shows that potential yield from inland sources even at a low level of management is relatively higher than the projected inland production and more than double the observed production.

The variation between the potential and the observed fish yields in the country has been attributed to the absolute lack of management strategies for our various inland waters.

The paper elaborates on possible management strategies for various categories of inland waters as a prelude towards increased fish production in the country.

INTRODUCTION

Fish provides the cheapest source of animal protein in the world. However, most valuable stocks in the wild are already fully exploited or overfished and relatively few new stocks are open to exploitation (Caton *et al*, 1974). In Nigeria, Ita (1982) proved beyond reasonable doubt that Kainji Lake has been overfished, using established biological indices of overfishing.

According to Abiagom (1980), the total demand projection for fish by 1985 will be 2.82 million metric tonnes as against the 687,446 metric tonnes expected from available resources as estimated by the Study Group on Fisheries (1981). Matton (1982) observed that Nigeria consumed about 1.5 million metric toones of fish in 1980 out of which about 900,000 metric tonnes of frozen fish were imported. By his projection, more than 2 million metric tonnes would be demanded by 1985 and out of this figure about 1.4 million metric tonnes would be imported. Events associated with the depletion of the country's foreign reserves have, however, overtaken this projection.

From the evidences shown so far, it is obvious that projected domestic demand for fish in Nigeria has never been met by dependence on yields from available aquatic resources. And the gap between fish supply and demand increases annually with progressive increase in population. The present trend in fish supply and demand stresses the need to explore ways of harnessing all available water resources in the country with the aim of optimizing their fisheries productivity. This could bring about the early realization of the much desired increased fish production to meet

domestic demand, particularly in these days of dwindling national economy and restrictions on the importation of fish, fish products and other essential commodities in order to streamline the drain in the nation's external reserve.

As a step towards achieving our national target for fish production, it became necessary to collate a comprehensive statistics of the total water surface area, location and distribution of flood ponds, cattle ponds, stagnant pools of seasonal rivers, burrow pits, mining paddocks, major rivers, existing and proposed fish ponds, lakes and reservoirs including those under construction in the nineteen States of the Federation. The purpose of such statistics was to permit the estimation of the fish yield potentials of these inland water bodies as a prelude towards evolving proper management practices to improve our fisheries resources and their utilization. This paper, therefore, presents a summary of the inventory survey of Nigeria inland waters and attempts preliminary estimates of their fish yield potentials together with a brief on strategies for attaining the target.

METHODOLOGY

(i) Inventory Survey:

Data were collected by scheduled visits to Ministries of Agriculture (Fisheries Division), River Basin Development Authorities, Ministries of Water Resources and Electricity Supply, National Electric Power Authority, State Water Boards and Corporations, ancilliary fisheries establishments and by questionnaire method as outlined in Ita *et al* (1985).

Relevant data and information were also extracted from State Reports presented at the 18th National Fisheries Development Committee Conference held in Sokoto in August 1982 and other fisheries publications.

(ii) Computation of Yield Potentials.

Available water surface areas were obtained from results of the inventory survey of water bodies in the country. Estimates of potential yeilds per hectare in lakes, rivers and flood plains were obtained from literature sources based on comparative studies of different inland water bodies in Africa e.g. Welcomme (1973; 1975) and Henderson and Welcomme (1974). Pond production estimates were obtained from extensive literature review in Ita (1980).

RESULTS AND DISCUSSION

(i) Inventory Survey.

Table 1 shows that existing reservoirs and minor lakes cover a land area of about 137,802 ha, while about 23,698 ha of reservoirs are proposed and another 11,034 ha are under construction in the country. Cattle ponds provide about 638 ha of water surface area in Bauchi, Kaduna and Kano States.

With regards to fish pond development, a total water surface area of about 1,945 ha were recorded as existing, while about 2,694 ha are proposed apart from the 836 ha still under construction (Table 1). It is pertinent here to note that the burrow pits recorded in some States the mining paddocks in Plateau State and the flood ponds in Anambra State were considered along with the fish ponds for ease of computation. Most States had no records of available surface areas of the burrow pits in their States.

A cursory look at Table 1 reveals that the 137,802 ha of existing reservoirs and minor lakes together with the existing total water surface area of cattle ponds and fish ponds i.e. 638 ha and 1,945 ha respectively give a total water surface area of 140,385 ha which is more than the 127,000 ha of water mass in Kainji Lake but almost four times smaller than Lake Chad which has an estimated surface area of 550,000 ha during normal flood years. The survey revealed the existence of numerous small bodies of water such as reservoirs and minor lakes, which together give about 137,802 ha of water mass spread all over the country.

It is anticipated that with the implementation of the proposed water reservoir and fish pond projects and the completion of those under construction in addition to the existing harnessed water bodies, a projected estimate of about 283,298 ha of water surface area of man-made inland water bodies will be available for fish production in the country (Table 1).

As shown in Table 2, Lake Chad and Kainji Lake give a total water surface area of about 677,000 ha. Another 10,812,410 ha of water mass is provided by the major perennial rivers in Nigeria. Miscellaneous stagnant pools of seasonal rivers have been estimated to supply about 200,000 ha of water surface area (Table 2). Flood plains, burrow pits and mining paddocks supply about 515,108 ha of water mass. These water surface area estimates in addition to the 283,298 ha of water mass of inland water bodies give a total projected National estimate of about 12,487 ha of inland water resources.

The poor status of reservoir development in Anambra, Lagos and Rivers States could be attributed to much dependence on bore-holes, perennial streams and rivers for both domestic and industrial water supply in the three States. Information collected from the Borno State Water Board revealed that reservoir and fish pond development in the State is hampered by geological and climatic factors such as soil characteristics and high temperature for most part of the year. The extensive areas of sandy clay and sandy soil in Borno State favour water loss by seepage and infiltration (USDIBR, 1968). The few hectares of water bodies recorded in the State have possibly been retained by shallowness of the underlying bedrock in locations where a few fish ponds and reservoirs are found. Over 340 ha out of the 543 ha of reservoirs and lakes in Borno State are irrigation canals within the Lake Chad basin on the Nigerian sector of the lake. The Borno State Water Board therefore, relies solely on boreholes for both domestic and industrial water supply.

Although, Borno and Sokoto States lie in the extreme arid zone in the country, the predominantly clayey nature of the soil and the proximity of the basement complex to the surface soil layers in Sokoto State minimize water loss by seepage and infiltration in fish ponds and reservoirs i.e. water loss in Sokoto State is mainly by evapotranspiration. FAO (1969) confirms that reservoirs in Sokoto basement complex are confined by impermeable rocks. Jones (1948) reported that the few perennial streams in Sokoto Province (now State) lie on the main water-table and that seasonal pools known as "tabkuna" owe their existence to a bed of clay and silt (fine-grained alluvium) which prevents the downward percolation of the water.

USDIBR (1968) believes that while fish production is influenced by many biological and physico-chemical factors, there is a definite relationship between water surface area and fish production. A large water mass has a high holding capacity for varied fish fauna and also provides a wide area of breeding and feeding ground for resident fish populations.

The advantage of good soil type accounts for about 14,623 ha of reservoir and about 175 ha of fish ponds in Sokoto State as against the 543 ha of reservoir and about 25 ha fish ponds recorded in Borno State.

The fisheries productivity of most reservoirs in the country, has not been optimized because little or no attempt has been made to artificially stock these water bodies. As is the case in most of the Northern States, reservoirs are created mainly for irrigated agriculture. The outflow from these reservoirs is diverted by most local farmers to irrigate their vegetable plots as observed in Kano State. But generally, the poor status of fish farm development in the majority of the States (Table 1) is a manifestation of the low premium placed on fish culture particularly in States where abundant water resources and conducive topographic and climatic conditions exist

A substantial number of reservoir and fish pond projects have had little or no recorded information or data about them with the result that many gaps especially under the "Surface Area (ha) Column" are not adequately covered to afford a comprehensive and a very reliable water surface area estimates of all hamessed water resources.

Some State Fisheries Departments do not show sufficient interest in the numerous private fish farms that abound in their States, probably due to the operational constraints. Consequently only very few of the private fish farms have had information and data on them documented.

Even the fisheries utility of most of the reservoirs recorded during the survey was not optimized as no evident effort had been made recently to stock them with indigenous fish species. Fish production in such reservoirs therefore, rely heavily on endemic species which are exposed to indiscriminate exploitation with the resultant effect of overfishing because of lack of fishing laws and regulations in the country.

(ii) Potential Yield Estimates.

Table 3 shows the computation of yield potentials from different categories of inland water bodies. Reservoirs are separated into two categories. Those measuring above 10,000 ha are classified as large (e.g. Kainji) and those below 10,000 ha are classifed as small reservoirs. In principle, large reservoirs cannot be managed by stocking in the absence of control of fishing although, new species could be introduced to fill vacant niches. The estimate shows that in the absence of control, a minimum yield of 60 kg/ha could be obtained as observed in Kainji Lake. However, with a bit of control of number of fishermen and gear sizes, the optimum yield of 100 kg/ha could be attained.

Most small reservoirs (for irrigation and water supply) constructed across seasonal rivers with limited concentration of indigenous fish species may have extremely low standing crop ranging from 0–30 kg/ha (e.g. Bakolori Reservoir) and would require stocking right from the onset in order to attain the potential yield. Those contructed across perennial rivers with hiwher concentration of indigenous fish species may attain the minimum potential of 100 kg/ha without stocking. The yield could be increased to 500 kg/ha with stocking, with or without fertilization, if the morpho-edaphic characteristics are favourable.

The productivity of large natural lakes like Lake Chad are higher than those of large reservoirs because of their well established littoral zones and shallow mean depth. The observed potential fish yield of 100 kg/ha could be considerably increased with control of number of fishermen and fishing gears used.

Fish ponds and mini-reservoirs ranging from one to ten hectares must necessarily be stocked with fish since they are fed by small seasonal or perennial streams and sometimes by artificial water supply from boreholes. Yields of 500 kg/ha could be attained with or without fertilization if the stocking density is adequate. If selective cropping is practised, only the initial stocking will be necessary with adequate stocking, fertilization and supplementary feeding, even higher yields of 3,000 kg/ha and above can be obtained in the case of fish ponds. Similar yields could be obtained from cattle ponds and mining paddocks if adequately managed.

A summary of the estimates (Table 3) shows that potential yields from the above inland water sources could give a minimum yield of 88,051 metric tonnes (m.t.) of fish per annum and a maximum yield of about 135,606 metric tonnes per annum.

Fish yields from the main course of both perennial and seasonal rivers can be extremely low. Large perennial rivers have been observed to yield up to 20 kg/ha and above. Flood plains are natural breeding grounds for fish and therefore, have higher fish yields than the main river course. Yields of about 50 kg/ha and above are commonly observed in flood plains of major African rivers (Welcomme, 1975).

Flood ponds left behind by receding flood waters are known to be more productive than the flooded plains. This is partly due to the increased concentration of fish in reduced volume of water and also to increased period of growth for the fish. Yields ranging from 100 kg/ha to 500 kg/ha have been recorded in some flood ponds. Stagnant pools of seasonal rivers are usually overcropped during the drv season resulting in very low standing crop. Some shallow pools

could be completely cropped with small meshed seine nets during the dry season. Both flood ponds and seasonal pools could be stocked for a limited period of time and cropped before the next flood season. Estimated total potential yields from rivers and their respective flood plains and ponds are about 264,163 m.t. per annum (minimum), and 376,097 m.t. per annum (maximum).

Table 4 shows the projected fish supply by Sector (1981 – 1985) with an average inland production of about 246,786 m.t. per annum. The relative contributions from inland sources to the total domestic production for the period is shown in Table 5. The mean percentage contribution from inland sources between 1981 and 1985 is 39%. The relative contribution form inland sources could be considerably increased with adequate management (Table 3) to over 70% of the domestic production.

Matton (1982) observed that in 1980, the total fish supply in country including import was about 1.5 million metric tonnes (m.t.) of which 900,000 m.t. were imported. This figure is far above the projected total supply for 1981 (Table 4). However, judging from the projected demand figure for 1981 of 2.2 million metric tonnes (Table 6), Matton's figure cannot be regarded as an over-estimate. The mean projected fish demand between 1981 and 1985 is about 2.3 million metric tonnes (m.t.) (Table 6), while the mean supply stands at 1.3 million m.t. giving a deficit of about 1.0 million m.t. per annum.

The import data from the Federal Department of Fisheries (Table 7) can be regarded as a gross under-estimate of the quantity of imported frozen fish into the country. This is partly caused by the unwillingness of our indigenous fishing companies to give accurate import records to Government Agencies needing such statistics. The reason for their secrecy cannot be far fetched and is not unconnected with the foreign exchange implications and tax evasion. This is why Matton's (1982) report under the auspices of the Food and Agriculture Organization (FAO) should be accepted as valid since it is supported with fish export figures from overseas agents to Nigeria.

(iii) Management Implications.

Evidences from this study point to the fact that the relative contributions from inland sources to the total domestic fish production can be considerably increased from its current position of about 39% to over 70% of the total domestic production, if a well outlined strategy for the management and development of the existing water bodies in the country could be worked out.

The first bold step in providing a State by State checklist of inland waters, their location and surface areas has been provided. The current study has provided in a nutshell the estimates of the hidden and untapped resources of our inland waters.

The next step which could be incorporated into the Fifth National Development Plan budgetting is for each State to undertake initial feasibility studies or invite Fisheries workers from various institutions in the country to carry out extensive study of their ongoing projects and make recommendations for improvement and increased development.

The Imo State Fisheries Department has taken this bold step by inviting workers from all over the country to constitute definite study groups on the following subjects:–

(i) Fishery statistics, fish stock assessment and restocking programme.

(ii) Potentials of Reservoirs, Lakes, and Flood ponds for fish production.

(iii) Accelerated fish seed production project.

(iv) Fish Feed Mill Project.

(v) Model Cooperative fishing programme and incentives to fish farmers/fishermen.

(vi) Fish processing, storage and marketing programme and pollution monitoring.

The reports presented by the various Study Groups to the Imo State Government cannot be said to be comprehensive because of the relatively short duration of the study period and constraints in conducting extensive tours of the existing project areas. This notwithstanding, they can serve as guidelines in assisting the Government in her development programmes pending the full commissioning of detailed feasibility studies on these subjects.

The Kainji Lake Research Institute on her part, plans to collaborate with State Fisheries Departments in carrying out the next phase of her inventory survey involving the collection of fishery statistics and stock assessment of Lakes, Rivers and Reservoirs in the various States with the objective of designing strategies for their specific management and development. Since it has been highlighted that most reservoirs constructed by damming seasonal rivers are inadequately supplied with fish right from the onset, our management strategy is likely to rely heavily on extensive culture programme involving the introduction of large quantities of fish fingerlings into such reservoirs.

As a step towards facilitating this programme, the Institute is developing both indoor and outdoor hatcheries for intensive fingerling production and is also encouraging some States by helping to recondition their hatchery complexes for similar exercises.

In view of the fact that reservoir stocking requires a minimum of 1,000 fingerlings per hectare of water body (Ita *et al*, 1982), the magnitude of fingerlings production required to stock both ponds and reservoirs in each State cannot be over-emphasized. However, since it is not advisable to stock unmanaged water bodies because of the high cost of fingerling production, the need for established fisheries laws and regulations to enforce control over the exploitation of the stocked water bodies becomes meaningful. The Institute has assisted the Federal Department of Fisheries in her campaign towards the promulgation of the Federal Inland Fisheries Laws and Regulations for Nigeria by organizing a drafting committee meeting comprising of delegates from the States and other Fisheries establishments in the country as well as legal experts. The proceedings of this meeting comprising both technical and legal drafts as well as the verbatim report of the business session have been circulated to all the States in manuscript form, while a comprehensive proceedings is being published by the Institute. It is hoped that these efforts will yield some fruits in the nearest future in order to speed up the scientific process of our inland fisheries management and development.

SUMMARY AND CONCLUSIONS

Our investigation reveals that Nigeria is blessed with an estimated inland water mass of about 12.5 million hectares capable of producing about 512,000 metric tonnes of fish annually. However, available statistics shows that our inland water bodies are currently producing less than 50% of their estimated fishery potential.

The checklist of all identified water bodies in all the States in the country has been published as a technical report of Kainji Lake Research Institute. It is hoped that these publications will be a source of inspiration and competition among fisheries scientists in the country with the ultimate objective of striving to attain the expected potential fish production in the various water bodies as highlighted in this paper.

The greatest obstacle to increased inland fish production is the haphazard method of exploitation due to the complete absence of established inland fisheries laws and regulations in the country coupled with inadequate stocking of small man-made reservoirs. The first author in another paper entitled "Some guidelines for the drafting of the inland fisheries laws and regulations for Nigeria: A proposal" has highlighted the major issues requiring urgent attention for

the effective management of our inland waters and with the final draft now submitted to the Federal Department of Fisheries, it is hoped that the processes for promulgating the law would be accelerated in order to render subsequent management attempts effective.

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Table 1 – Available harnessed Water Resources in the Nineteen States of Nigeria (From Ita et Al 1985)

State	Surface Area (ha) of Reservoirs and Lakes			Surface Area of Cattle Pond (ha)	Surface Area (ha) of Fish Ponds and Flood Ponds			Projected Total Water Surface Area (ha)
	Existing	proposed	Under Construction		Existing	Proposed	Under Construction	
Anambra	37.65	Nil	5000.0	Nil	1705.66	Nil	Nil	6743.31
Bauchi	298.50	Nil	52200.0	15.50	15.0	Nil	Nil	52529.0
Bendel	199.30	Nil	130.0	Nil	130.0	247.0	15.0	721.30
Benue	114.0	Nil	Nil	Nil	87.50	600.0	200.0	1001.50
Borno	542.90	Nil	Nil	Nil	24.70	Nil	Nil	567.60
Cross River	1182.0	15084.20	80.0	Nil	51.40	9.30	30.0	16426.90
Gongola	17848.0	Nil	Nil	Nil	Nil	Nil	Nil	17848.0
Imo	354.50	3500.0	Nil	Nil	123.27	1.50	10.22	3989.49
Kaduna	8440.90	1580.0	4000.0	560.0	14.0	Nil	Nil	14594.90
Kano	42772.50	Nil	Nil	63.0	94.21	Nil	Nil	42929.71
Kwara	1968.60	Nil	4.0	Nil	22.09	8.50	3.50	2006.69
Lagos	Nil	Nil	Nil	Nil	13.43	10.0	Nil	23.43
Niger	36223.50	3500.0	32520.0	Nil	4.70	70.0	40.0	72358.20
Ogun	4028.50	Nil	100.0	Nil	48.15	39.0	46.0	4261.65
Ondo	2550.0	N.S.	Nil	Nil	84.19	549.96	2.06	3186.21
Oyo	3272.61	Nil	Nil	Nil	448.58	33.0	Nil	3754.19
Plateau	3345.0	Nil	Nil	Nil	471.0	Nil	Nil	3816.0
Rivers	Nil	Nil	Nil	Nil	61.91	1026.25	499.58	1587.74
Sokoto	14623.25	34.0	20000.0	Nil	195.40	100.0	Nil	34952.65
TOTAL	**137801.71**	**23698.20**	**114034.0**	**638.50**	**1945.19**	**2694.51**	**836.36**	**283298.47**

Table 2. – Summary of Water Surface area of lakes, reservoirs, ponds and major rivers in Nigeria (From Ita et al, 1985)

Water Body	*Surface Area*
Lake Chad (Nigerian Sector)	550,000.0 ha
Kainji Lake	127,000.0 ha
Anambra River	1,401,000.0 ha
Benue River	129,000.0 ha
Cross River	3,900,000.0 ha
Imo River	910,000.0 ha
Kwa Iboe River	500,000.0 ha
Niger River (Less Kainji and Jebba Lakes)	169,810.18 ha
Ogun River	2,237,000.0 ha
Oshun River	1,565,400.0 ha
Fish Ponds	5,476.06 ha
Flood ponds	1,650.0 ha
Cattle ponds	638.50 ha
Miscellaneous stagnant pool of seasonal Rivers	200,000.0 ha
Reservoirs	275.534. 91.ha
Flood plains	515,000.0 ha
Burrow pits	2.0 ha
Mining paddocks	106.0 ha
Total	**12,487,817.65 ha**

Table 3 – Estimated Fish Yield Potential of Nigeria Inland Waters.

	Type of Water Body	*Estimated Total Surface Area (ha)*	*Potential Yield per ha and Total Annual Yield (m.t.) (with little or no management)*	*Potential Yield per ha and Total Annual Yield (m.t.) (with adequate management).*
1.	*Reservoirs, Lakes and Ponds.*			
	(i) Large reservoirs (e.g. Kainji)	250,387.0	60/kg/ha 15,023.2 mt.	100 kg/ha 25,038.7 m.t.
	(ii) Small reservoirs (e.g. for water supply).	25,148.0	100 kg/ha 2,514.8 m.t.	500 kg/ha 12,574.0 m.t.
	(iii) Major Lakes (e.g. Chad)	677,000.0	100 kg/ha 67,700.0 m.t.	120 kg/ha 81,240.0 m.t.
	(iv) Fish Ponds	5,476.0	500 kg/ha 2,738.0 m.t.	3000 kg/ha 16,428.0 m.t.
	(v) Cattle Ponds	639.0	100 kg/ha 63.9 m.t.	500 kg/ha 319.5 m.t.
	(vi) Mining Paddocks	106.0	100 kg/ha 10.6 m.t.	500 kg/ha 53.0 m.t.
	Total =	**958,756.0**	**88,050.5**	**135,605.5**
2.	*Rivers.*			
	(i) Flood Ponds	1,650.0	100 kg/ha 165.0 m.t.	500 kg/ha 825.0 m.t.
	(ii) Main River Course	10,812,410.0	20 kg/ha 216,248.3 my.	30 kg/ha 324,372.3 m.t.
	(iii) Flood Plain	515,000.0	50 kg/ha 25,750.0m.t.	60 kg/ha 30,900.0 m.t.
	(iv) Stagnant Pools of Seasonal Rivers	200,000.0	20 kg/ha 4,000.0 mt.	100 kg/ha 20,000.0 m.t.
	Total =	**11,529,060.0**	**246,163.2**	**376,097.3**
	GRAND TOTAL =	**12,487,816.0**	**334,213.7**	**511,702.8**

Table 4 – Projected Fish Production in Nigeria – 1981–85 (in metric tonnes). Modified from Study Group on Fisheries (1981)

Year	*Lakes and Ponds*	*Rivers*	*Total Inland Production*	*Coastal and Brackish Water*	*Inshore Fisheries*	*Total Marine Production*	*Total Domestic Production*	*Import*	*Grand Total Fish Supply*
1981	73,596	159,872	233,468	334,150	13,857	348,007	581,475	397,744	979,219
1982	75,436	164,509	239,945	350,858	15,340	366,198	606,143	485,248	1,091,391
1983	77,322	169,279	246,601	368,400	16,981	385,381	631,982	592,002	1,223,984
1984	79,255	174,188	253,443	386,820	18,799	405,619	659,062	722,243	1,381,305
1985	81,236	179,239	260,475	406,161	20,810	426,971	687,446	881,136	1,568,582

Table 5. – Total Projected Domestic Fish Production and Supply including imports and the Corresponding percentage contributions from Inland sources and Import between 1981 and 1985, (Modified from Study Group on Fisheries 1981)

Year	*Total domestic Fish Production*	*% Contribution from Inland Waters*	*Total Fish Supply including imports*	*% Contribution for Imports*
1981	581,475	40.2	979,219	40.6
1982	606,143	39.6	1,091,391	44.5
1983	631,982	39.0	1,223,984	48.4
1984	659,062	38.5	1,381,305	52.3
1985	687,446	37.9	1,568,582	56.2

Table 6 – Supply and Demand Projections for 1981 – 1985 (From: Study Group on Fisheries 1981)

Year	*Projected Supply*	*Projected Demand*	*Projected Deficit*
1981	979,219	2,170,010	1,190,791
1982	1,091,391	2,235,100	1,143,709
1983	1,223,984	2,302,150	1,078,166
1984	1,381,305	2,371,200	989,895
1985	1,568,582	2,442,330	873,748

Table 7 – Nigeria Fish Supply by Sectors 1979 – 1983

Sectors	*1979*	*1980*	*1981*	*1982*	*1983**
Total	753,435	713,596	741,221	760,195	675,977
1. Artisanal					
i. Costal and Brackish water	264,495	274,158	323,916	377,683	376,943
ii. Inland Rivers and Lakes	259,632	187,206	157,867	119,527	124,943
2. Industrial					
Commercial Trawlers					
i. Coastal Fish	9,406	16,342	12,435	15,052	11,213
ii. Coastal Shrimp	1,902	1,890	2,003	3,525	2,145
iii. Distant Water (Import)	218,000	234,000	245,000	244,408	160,728

Source: Federal Department of Fisheries Annual Report, 1983.

*Tentative.